1 WHAT IS CLAIMED IS:

2   1. A catalyst composition comprising:

3   a carrier;

4   a catalytically effective amount of silver; and,

5   a rubidium promoter comprising a quantity of from

6   5 μmole to up to 60 μmole per gram of catalyst `

7   composition.

1   2. The catalyst composition of claim 1, wherein the

2 carrier comprises an α-alumina having a BET surface area

3 of from 0.01 m^2/g to 50 m^2/g, and an apparent porosity of

4 from 0.1 ml/g to 2 ml/g, measured by water absorption.

1   3. The catalyst composition of claim 1, wherein the

2 carrier comprises a silver bonded calcium carbonate

3 having a crush strength of at least 22 N.

1   4. The catalyst composition of claim 1, wherein the

2 carrier comprises a silver bonded calcium carbonate

3 wherein the weight ratio of silver to calcium carbonate

4 is from 1:5 to 1:100.

1   5. The catalyst composition of claim 1, wherein the

2 carrier comprises a silver bonded calcium carbonate

3 having a specific surface area of from 1 m^2/g to 20 m^2/g.

1   6. The catalyst composition of claim 1, wherein the

2 carrier comprises a silver bonded calcium carbonate

3 having a specific surface area of from 1 m^2/g to 3 m^2/g.

1   7. The catalyst composition of claim 1, wherein the

2 carrier comprises a silver bonded calcium carbonate

3 having an apparent porosity of from 0.05 ml/g to 2 ml/g.

1   8. The catalyst composition of claim 1, wherein the

2 carrier comprises a silver bonded calcium carbonate

3 having an apparent porosity of from 0.1 ml/g to 1.5 ml/g.

1   9. The catalyst composition of claim 1, wherein the

2 carrier comprises at least 95 %w α-alumina.

1   10. The catalyst composition of claim 9, wherein the

2 α-alumina carrier has a pore size distribution within a

3 total pore volume such that pores with diameters in the

4 range of from 0.2 μm to 10 μm represent more than 75 % of

5 the total pore volume; pores with diameters greater than

6 10 μm represent less than 20 % of the total pore volume;

7 and pores with diameters less than 0.2 μm represent less

8 than 10 % of the total pore volume.

1   11. The catalyst composition of claim 9, wherein the

2 α-alumina carrier has a pore size distribution such that

3 pores with diameters in the range of from 0.2 μm to 10

4 μm represent more than 90 % of the total pore volume;

5 pores with diameters greater than 10 μm represent less

6 than 10 % of the total pore volume; and pores with

7 diameters less than 0.2 μm represent less than 7 % of the

8 total pore volume.

1   12. The catalyst composition of claim 9, wherein the

2   α-alumina carrier has a surface area of at most 2.9 m^2/g.

1   13. The catalyst composition of claim 9, wherein the

2   α-alumina carrier has a water absorption of at least 0.35

3   ml/g and a surface area in the range of from 1.4 m^2/g to

4   2.6 m^2/g.

1   14. The catalyst composition of claim 9, wherein the

2   α-alumina carrier is made by a method which comprises:

3   forming a mixture comprising:

4   (a) from 50 %w to 90 %w of a first particulate α-

5   alumina having an average particle size of from more than

6   10 μm up to 100 μm; and

7   (b) from 10 %w to 50 %w of a second particulate α-

8   alumina having an average particle size of from 1 μm to

9   10 μm; the %w being based on the total weight of α-

10 alumina in the mixture; and,

11   firing the mixture to form the carrier.

1   15. The catalyst composition of claim 14, wherein

2   the α-alumina carrier comprises:

3   (a) from 65 %w to 75 %w, relative to the total

4   weight of α-alumina in the mixture, of a first

5   particulate α-alumina having an average particle size of

6   from 11 μm to 60 μm;

7   (b) from 25 %w to 35 %w, relative to the total

8   weight of α-alumina in the mixture, of a second

9   particulate α-alumina having an average particle size of

10 from 2 μm to 6 μm;

11   (c) from 2 %w to 5 %w of an alumina hydrate,

12 calculated as aluminum oxide relative to the total weight

13 of α-alumina in the mixture;

14   (d) from 0.2 %w to 0.8 %w of an amorphous silica

15 compound, calculated as silicium oxide relative to the

16 total weight of α-alumina in the mixture; and,

17   (e) from 0.05 %w to 0.3 %w of an alkali metal

18 compound, calculated as the alkali metal oxide relative

19 to the total weight of α-alumina in the mixture.

1   16. A process for the oxidation of an olefin, which

2   process comprises reacting the olefin with oxygen in the

3   presence of a catalyst composition comprising a carrier;

4   a catalytically effective amount of silver; and, a

5   rubidium promoter, wherein the rubidium metal promoter

6   comprises a quantity of from 5 μmole to up to 60 μmole

7   per gram of catalyst composition.

1   17. The process of claim 16, wherein the carrier

2   comprises a silver bonded calcium carbonate having a

3   crush strength of at least 22 N.

1   18. The process of claim 16, wherein the carrier

2   comprises a silver bonded calcium carbonate wherein the

3   weight ratio of silver to calcium carbonate is 1:9.

1   19. The process of claim 16, wherein the carrier

2   comprises a silver bonded calcium carbonate having a

3   specific surface area of from 1 m^2/g to 20 m^2/g.

1   20. The process of claim 16, wherein the carrier

2   comprises a silver bonded calcium carbonate having a

3   specific surface area of from 1 m^2/g to 3 m^2/g.

1   21. The process of claim 16, wherein the carrier

2   comprises a silver bonded calcium carbonate having an

3   apparent porosity of from 0.05 ml/g to 2 ml/g.

1   22. The process of claim 16, wherein the carrier

2   comprises a silver bonded calcium carbonate having an

3   apparent porosity of from 0.1 ml/g to 1.5 ml/g.

1   23. The process of claim 16, wherein the carrier

2   comprises an α-alumina carrier which has been obtained by

3   a method which comprises:

4   forming a mixture comprising:

5   (a) from 50 %w to 90 %w of a first particulate α-

6   alumina having an average particle size of from more than

7   10 μm up to 100 μm; and,

8   (b) from 10 %w to 50 %w of a second particulate α-

9   alumina having an average particle size of from 1 μm to10

10   μm; and wherein the %w is based on the total weight of α-

11   alumina in the mixture;

12   forming the mixture into shaped bodies; and,

13   firing the shaped bodies to form the carrier.

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2   24. The process of claim 16, wherein the carrier

3 comprises an α-alumina carrier having a pore size

4 distribution in a total pore volume such that pores with

5 diameters in the range of from 0.2 μm to 10 μm represent

6 more than 75 % of the total pore volume; pores with

7 diameters greater than 10 μm represent less than 20 % of

8 the total pore volume; and pores with diameters less than

9 0.2 μm represent less than 10 % of the total pore volume.

1   25. The process of claim 16, wherein the carrier

2 comprises an α-alumina carrier having a pore size

3 distribution in a total pore volume such that pores with

4 diameters in the range of from 0.2 μm to 10 μm comprise

5 more than 90 % of the total pore volume; pores with

6 diameters greater than 10 μm represent less than 10 % of

7 the total pore volume; and pores with diameters less than

8 0.2 μm represent less than 7 % of the total pore volume.

1   26. The process of claim 16, wherein the carrier

2 comprises an α-alumina carrier having a surface area of

3 at most 2.9 m^2/g.

1   27. The process of claim 16, wherein the carrier

2 comprises an α-alumina carrier having a water absorption

3 of at least 0.35 ml/g and a surface area in the range of

4 from 1.4 m^2/g to 2.6 m^2/g.

1   28. The process of claim 16, wherein the carrier

2 comprises an α-alumina carrier made by a method which

3 comprises:

4   forming a mixture comprising:

5   (a) from 50 %w to 90 %w of a first particulate α-

6   alumina having an average particle size of from more than

7   10 μm up to 100 μm; and

8   (b) from 10 %w to 50 %w of a second particulate α-

9   alumina having an average particle size of from 1 μm to

10   10 μm; the %w being based on the total weight of α-

11   alumina in the mixture; and,

12   firing the mixture to form the carrier.

1   29. The process of claim 16, wherein the carrier

2   comprises an α-alumina carrier having a composition

3   comprising:

4   (a) from 65 %w to 75 %w, relative to the total

5   weight of α-alumina in the mixture, of a first

6   particulate α-alumina having an average particle size of

7   from 11 μm to 60 μm;

8   (b) from 25 %w to 35 %w, relative to the total

9   weight of α-alumina in the mixture, of a second

10   particulate α-alumina having an average particle size of

11   from 2 %w to 6 %w;

12   (c) from 2 %w to 5 %w of an alumina hydrate,

13   calculated as aluminum oxide relative to the total weight

14   of α-alumina in the mixture;

15   (d) from 0.2 %w to 0.8 %w of an amorphous silica

16   compound, calculated as silicium oxide relative to the

17   total weight of α-alumina in the mixture; and,

18   (e) from 0.05 %w to 0.3 %w of an alkali metal

19 compound, calculated as the alkali metal oxide relative

20 to the total weight of α-alumina in the mixture.

1   30. The process of claim 16, which process further

2 comprises adding an organic chloride promoter.

1   31. The process of claim 30, wherein the organic

2 chloride promoter is present at a concentration of at

3 least 50 ppm by volume.

1   32. The process of claim 16, which process further

2 comprises adding a NO_x promoter, wherein x is 1 or 2.

1   33. The process of claim 32, wherein the NO_x promoter

2 is present at a concentration of 500 ppm by volume.

1   34. A composition comprising propylene oxide, made

2 by a process comprising reacting propylene with oxygen in

3 the presence of a catalyst composition comprising silver

4 and a rubidium promoter deposited on a carrier, wherein

5 the rubidium metal promoter comprises a quantity of from

6 30 μmole to 50 μmole per gram of catalyst composition

1   35. A composition comprising a derivative of

2 propylene oxide, wherein the propylene oxide is made by a

3 process comprising reacting propylene with oxygen in the

4 presence of a catalyst composition comprising a carrier;

5 a catalytically effective amount of silver; and, a

6 rubidium promoter deposited on a carrier, wherein the

7   rubidium metal promoter comprises a quantity of from   5

8   μmole to up to 60 μmole per gram of catalyst composition.